R007-02
C 会場 ：11/25　PM2 （15:30-18:15）
15:45〜16:00

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Global analysis of the cosmic-ray rigidity spectrum during extended Forbush decreases and its implication

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We present the global analysis of two extended decreases of the galactic cosmic ray intensity observed by world-wide networks of ground-based detectors in 2012. This analysis is capable of separately deriving the cosmic ray density (or omnidirectional intensity) and anisotropy each as a function of time and rigidity. A simple diffusion model along the spiral field line between Earth and a cosmic-ray barrier indicates the long duration of these events resulting from about 190 degree eastern extension of a barrier such as an IP-shock followed by the sheath region and/or the corotating interaction region (CIR). It is suggested that the coronal mass ejection merging and compressing the preexisting CIR at its flank can produce such the extended barrier. The derived rigidity spectra of the density and anisotropy both vary in time during each event period. In particular we find that the temporal feature of the “phantom Forbush decrease” reported in an analyzed period is dependent on rigidity, looking quite different at different rigidities. From these rigidity spectra of the density and anisotropy, we derive the rigidity spectrum of the average parallel mean-free-path of pitch angle scattering along the spiral field line and infer the power spectrum of the magnetic fluctuation and its temporal variation. Possible physical cause of the strong rigidity dependence of the “phantom Forbush decrease” is also discussed. These results demonstrate the high-energy cosmic rays observed at Earth responding to remote space weather.